sumed by them in 61 days of May and June would be 3599. In view of our assumption, however, the actual fry mortality would be much higher than this estimate since the birds also fed during other parts of the day, although not as vigorously as in the early morning.

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REFERENCES

ALI, S. & RIPLEY, S. D. (1970): Handbook of the Birds of India and Pakistan. Vol. 4. Oxford University Press, Bombay.

MASON, G. W. & LEFROY, H. M. (1912): The food of birds in India. *Mem. Dep. Agric. India Ent. 3*: 1-371.

MUKHERJEE, A. K. (1975): Food habits of water-birds of the Sundarban, 24 Parganas district, West Bengal, India — V. *J. Bombay nat. Hist. Soc. 72*(2): 422-447.

17. PREDATION OF GOLDENBACKED WOODPECKER, *DINOPIUM BENGHALENSE* (LINN.) ON CARDAMOM SHOOT-AND-FRUIT BORER, *DICHOCROCIS PUNCTIFERALIS* (GUENE)

On 16 September, 1984 a Goldenbacked Woodpecker was sighted predating on the cardamom shoot-and-fruit borer, *D. punctiferalis* in Mudigere, Chickamagalur. The woodpecker with its powerful bill chiselled out shoot peelings, located the borer larvae inside the shoot tunnel, and gulped them down. The bird flew to the next cardamom clump. The woodpecker located the borer-infested cardamom sucker and using the black, stiff tail feathers as a brace, held it tight by claws. The bird tapped on the shoot and again began chiselling away shoot peelings.

Of the 60 cardamom plantations surveyed from 1984 to 1986 in Chickamagalur District, Karnataka, the activity of the woodpecker was recorded only in six (10%). On an average, the woodpecker devoured 22.80 per cent of borer larvae (Table 1). The survey indicated that the woodpecker's predatory activity was not found in plantations where —

(a) Pesticides were regularly used and/or

(b) Old trees of species of *Artocarpus, Terminalia, Albizzia, Acacia, Bombax, Sapindus, Cinnamomum, Machilus, Garyga, Alstonia, Dipterocarpus, Elaecarpus* and *Cettis* were absent. The woodpecker's predatory activity was also not recorded in plantations where trees of mostly one species (e.g. *Erythrina lithosperma*) were raised to

TABLE 1

WOODPECKER PREDATION ON CARDAMOM BORER IN SOME AREAS OF CHICKAMAGALUR

Date	Area	Cardamom clumps showing woodpecker predation on borer (%)
16-ix-1984	Arahally	12.5
2-viii-1985	Makhonhally	6.0
4-viii-1985	Hosagiri	15.0
14-ix-1985	Kotegehar	21.0
8-x-1985	Mudigere	31.0
5-vii-1986	Goudahally	51.0

provide shade for cardamom. This is because such plantations offer no suitable sites for nesting and shelter. Because of their uniformity in canopy structure, age and size they are structurally less diverse compared to plantations where natural shade from several species of trees is regulated. Further, trees like *Erythrina* do not harbour insects like grubs, caterpillars and internal wood borers which are preferred by woodpecker.

The predatory activity of woodpecker was confined mostly to valleys. The woodpecker foraged cardamom planted area during evenings, mostly when there was no human intervention. The woodpecker was very actively feeding on borer larvae from August to December, when borer activity is also at peak.

The Pyralid, *D. punctiferalis* is a pest on cardamom (David and Kumaraswami 1982). Despite six sprays recommended for controlling the borer (UAS, 1985), the damage persists. Three species of insect parasites have been recorded on the borer but borer mortality due to parasitisation is negligible (0.05%). In this context, the predatory activity of the woodpecker on the cardamom borer is crucially important.

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REFERENCES

DAVID, V. B. & KUMARASWAMI, T. (1982): Elements of Economic Entomology. Popular Book Depot, Madras. pp. 536.

UNIVERSITY, OF AGRICULTURAL SCIENCES (UAS), (1985): Cultivation practices for plantation crops. UAS, Bangalore. pp. 78.

18. MOVEMENT OF THE EASTERN SWALLOW (*HIRUNDO RUSTICA GUTTURALIS*) RINGED AT MOOTPUZHA (KERALA)

Every year, in the month of October, local newspapers in Kerala write about the large congregation of Swallows roosting on telegraph wires across Mootpuzha river, close to Mootpuzha bridge. These attract the attention of people crossing over the bridge. The birds had been identified many years earlier by Dr. V. S. Vijayan, of the Society's Bharatpur Hydrobiology project as the Eastern Swallow (*Hirundo rustica*). In October, 1985 attention was again drawn to this congregation by Mr. K. K. Surendran. At his instance, I was asked to try and ring some of the swallows. I, therefore, visited the area with 200 Z-size rings and in the night, with the help of two assistants caught 199 birds by using a large butterfly net made out of a mist net. All the birds were ringed and released at the end of the bridge in bright moonlight. The birds were seen flying back to their roost. Out of the 199 birds